

THE NORTH AMERICAN SPECIES,  
*BOERHAVIA SPICATA* (NYCTAGINACEAE),  
IN NORTHWESTERN ARGENTINA

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*Boerhavia spicata* Choisy is a morphologically variable herb widespread in the Sonoran and Chihuahuan deserts of the southwestern United States and northern Mexico, and heretofore known only from that region. During the course of field study as a worker in the IBP Structure of Ecosystems Program, I found an isolated population of this species in Catamarca Province, Argentina. This constitutes the first known occurrence of the species in South America, and is an addition to the already sizable list of species known to have range disjunctions between the desert regions of southwestern North America and northern Argentina and Chile (Bray, 1900; Johnston, 1940; Raven, 1963; Solbrig, 1972).

Plants of *Boerhavia spicata* occur abundantly on a small group of sand dunes located 35 km west of the town of Andalgalá, at the north edge of the Bolsón de Pipanaco. In spite of extensive field work in the Andalgalá region over an eight-month period in 1972-73, no other populations, or even isolated individuals, of the plant were found. Several Argentine botanists familiar with the flora of the region were consulted, and none had seen the species previously. In addition, a literature search revealed no references to the occurrence of *B. spicata* or other species with similar characteristics in South America.

I considered the possibility that the population might represent an undescribed species. An inspection of the worldwide collection of *Boerhavia* at the Harvard University Herbaria revealed a strong resemblance between the Argentine specimens and members of the *B. spicata* complex (explained below). No marked resemblance was found to any other species of *Boerhavia*.

The *Boerhavia spicata* complex has been considered by a number of authors (Standley, 1909; Tidestrom and Kittell, 1941; Kearney and Peebles, 1960; Ferris, 1964) to consist of three to four distinct species: *B. spicata* Choisy, *B. watsonii* Standley, *B. coulteri* (Hook. f.) S. Watson, and *B. torreyana* (S. Watson) Standley. More recently it has been interpreted as a single morphologically variable species, *B. spicata* Choisy (Reed, 1969). Upon examination of the Harvard Herbaria collection of the complex (50 specimens), I tend to agree with Reed's interpretation that we are dealing with a single variable species. The characters used by the above-mentioned authors to distinguish the four species (e.g., degree of crowding of the flowers in the inflorescence; shape of the ridges and furrows of the anthocarp; degree of rugosity of the anthocarp; presence or absence of glandular pubescence on the stems and glandular dots on the foliage) all show gradual variation between the extreme character states. However, the species should, perhaps, be segregated into two varieties — one, with a center of distribution in the Sonoran Desert, having a tendency towards closely spaced flowers, acute to acuminate leaf-apices, and densely glandular-villous stems; and the other, with a center of distribution in the Chihuahuan Desert, having a tendency towards loosely spaced flowers, obtuse leaf apices, and puberulent stems with few or no glands. The Argentine population clearly has affinities with the latter variety.

The above analysis is intended as a suggestion only. I do not feel justified in dividing the species into varieties based solely on the very limited herbarium study that I have done. Crossing experiments in the laboratory and a field study of ecotypic variation would help greatly to clarify the taxonomic relationships within this difficult complex. Meanwhile, for the purposes of identifying the Argentine population, I am following Reed in his placement of the entire complex in the species *Boerhavia spicata* Choisy. The Argentine plants are clearly members of the complex; thus until someone does a definitive revision of the genus, they should be placed in *B. spicata* Choisy.

The following description is patterned after Reed's description of *Boerhavia spicata* but has been modified so as to describe the Argentine population rather than the species as a whole:

Erect or decumbent annual from a slender taproot, usually with many branches spreading from the base; stems 2-6 dm long, much branched, often tinged with pink, white-puberulent on the lower parts (occasionally sparsely glandular-hirtellous at the nodes only), glabrous on the upper parts; leaves opposite, the petioles puberulent, 0.2-3.0 cm long, the leaf-blades oval to ovate or ovate-lanceolate, 0.8-4.0 cm long, 0.4-2.5 cm wide, truncate to obtuse or slightly oblique at base, obtuse to acuminate at the apex, the margins entire to sinuate, green above, paler beneath, brown-punctate or not, sparsely puberulent to glabrate; inflorescence cymose-paniculate, spreadingly much-branched, the branches slender, glabrous; flowers on short pedicels 0.3 to 1.0 mm long, loosely spaced on the ultimate branches of the inflorescence; bracts minute, deciduous, ovate to lanceolate, pinkish, ciliolate; perianth pale pink, 1.5 mm long, puberulent; stamens 2, short-exserted; anthocarp narrowly obovoid, 3 mm long, 1 mm wide, rounded at apex, acute at the base, 5-angulate, the sulci nearly closed, strongly rugose.

Specimens (*Cantino* 664, 724) are deposited in the herbaria of the following institutions in the United States and Argentina: Harvard University, University of Michigan, University of Arizona, New Mexico State University, University of Texas, Instituto Miguel Lillo (Tucumán), Universidad Nacional de Córdoba, and Instituto de Botánica Darwinion (San Isidro).

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## LITERATURE CITED

- BRAY, W. L. 1900. The relations of the North American flora to that of South America. *Science* II. 12: 709-716.
- FERRIS, R. S. 1964. Nyctaginaceae. Pp. 476-482. *In* F. SHREVE & I. L. WIGGINS, *Vegetation and flora of the Sonoran Desert*. Vol. 1. Stanford University Press, Stanford, Calif.
- JOHNSTON, I. M. 1940. The floristic significance of shrubs common to North and South American deserts. *Jour. Arnold Arb.* 21: 356-363.
- KEARNEY, T. H., & R. H. PEEBLES. 1960. *Arizona Flora*. Univ. of Calif. Press, Berkeley & Los Angeles. (*Boerhavia*, pp. 275-277)
- RAVEN, P. H. 1963. Amphitropical relationships in the floras of North and South America. *Quart. Rev. Biol.* 38: 151-177.
- REED, C. F. 1969. Nyctaginaceae. Pp. 203-220. *In* C. L. LUNDELL, *Flora of Texas*. Vol. 2. Texas Research Foundation, Renner, Texas.
- SOLBRIG, O. T. 1972. New approaches to the study of disjunctions with special emphasis on the American amphitropical desert disjunctions. Pp. 85-100. *In* D. VALENTINE, ED. *Taxonomy, phyto-geography, and evolution*. London.
- . 1972. The floristic disjunctions between the "Monte" in Argentina and the "Sonoran Desert" in Mexico and the United States. *Ann. Missouri Bot. Gard.* 59: 218-223.
- STANDLEY, P. C. 1909. The Allioniaceae of the United States with notes on Mexican species. *Contr. U.S. Natl. Herb.* 12: 303-389.
- TIDESTROM, I., & T. KITTELL. 1941. *A flora of Arizona and New Mexico*. Catholic University of America Press, Washington, D.C. (*Boerhavia*, pp. 652-655)

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